



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/562,751

12/28/2005

Akio Ishikawa

56799/A400

7839

23363 7590 05/14/2008
CHRISTIE, PARKER & HALE, LLP
PO BOX 7068
PASADENA, CA 91109-7068

EXAMINER

RUSH, ERIC

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

05/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/562,751	Applicant(s) ISHIKAWA, AKIO	
	Examiner ERIC RUSH	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/31/2006; 12/28/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1 – 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuwabara Masayuki JP 2002-342757 A in view of Lapidus et al. U.S. Patent No. 4,581,762.

- With regards to claims 1 and 9, Kuwabara Masayuki teaches a pattern comparison inspection method and apparatus which comprises an imaging portion which captures an image of an inspection target pattern having a repeated pattern region with repeated patterns formed in a repeated fashion at a prescribed repeat pitch, (Kuwabara Masayuki,

Paragraph 0001 Lines 1 – 6, Paragraph 0005 Lines 1 - 5) a storing portion which stores said captured image of said inspection target pattern, (Kuwabara Masayuki, Paragraph 0004 Lines 6 - 11) a pattern comparing portion which compares, on said stored image, image signals taken from positions located a first integral multiple of said repeat pitch away from each other within an inspection region defined inside said repeated pattern region, (Kuwabara Masayuki, Paragraphs 0006 - 0007) and a defect detecting portion which detects a defect in said inspection target pattern based on a result of said comparison, (Kuwabara Masayuki, Paragraphs 0006 – 0007) said apparatus comprising: a reference position selecting portion which selects from among positions on said inspection target pattern a reference position which is judged whether it should be contained in said inspection region; (Kuwabara Masayuki, Paragraph 0006 Lines 1 - 18) an image comparing portion which compares an image signal at said reference position with an image signal at a position located a second integral multiple of said repeat pitch away from said reference position and a prescribed distance inward of the boundary of a region that is known to be said repeated pattern region; (Kuwabara Masayuki, Paragraph 0006 Lines 1 - 18) and an inspection region setting portion. (Kuwabara Masayuki, Paragraphs 0006 - 0008) Kuwabara Masayuki fails to teach an inspection region setting portion which sets said inspection region by containing therein said reference position when a comparison

result from said image comparing portion shows a value not greater than a prescribed threshold value. Lapidus et al. teach an inspection region setting portion which sets said inspection region by containing therein said reference position when a comparison result from said image comparing portion shows a value not greater than a prescribed threshold value.

(Lapidus et al., Column 18 Lines 5 – 12, Lines 40 – 57, and Column 19 Lines 11 - 26) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Kuwabara Masayuki with the teachings of Lapidus et al. Lapidus et al. teach determining an inspection region whereby once determined further attributes and measurements may be obtained through the use of visual tools. This modification would have been prompted in order to accurately compare the two regions of Kuwabara Masayuki by verifying that the positions for comparison belong to a first and second non-overlapping pattern region.

- With regards to claims 2 and 10, Kuwabara Masayuki teaches a pattern comparison inspection method and apparatus which comprises an imaging portion which captures an image of an inspection target pattern having a repeated pattern region with repeated patterns formed in a repeated fashion at a prescribed repeat pitch, (Kuwabara Masayuki, Paragraph 0001 Lines 1 – 6, Paragraph 0005 Lines 1 - 5) storing portion which stores said captured image of said inspection target pattern,

(Kuwabara Masayuki, Paragraph 0004 Lines 6 - 11) a pattern comparing portion which compares, on said stored image, image signals taken from positions located a first integral multiple of said repeat pitch away from each other within an inspection region defined inside said repeated pattern region, (Kuwabara Masayuki, Paragraphs 0006 - 0007) and a defect detecting portion which detects a defect in said inspection target pattern based on a result of said comparison, (Kuwabara Masayuki, Paragraphs 0006 – 0007) said apparatus comprising: a reference position selecting portion which selects a reference position which is judged whether it should be contained in said inspection region, by incrementally shifting said reference position by a prescribed distance within said inspection target pattern; (Kuwabara Masayuki, Paragraphs 0005 – 0007, Paragraph 0009, each pixel of a pattern is compared with it's respective pixel in an adjoining pattern) an image comparing portion which compares an image signal at said reference position with an image signal at a position located a second integral multiple of said repeat pitch away from said reference position; (Kuwabara Masayuki, Paragraph 0006 Lines 1 - 18) and an inspection region setting portion. (Kuwabara Masayuki, Paragraphs 0006 - 0008) Kuwabara Masayuki fails to teach an inspection region setting portion which sets said reference position as the boundary of said inspection region when a comparison result, obtained from said image comparing portion as a result of incrementally shifting said reference

position by said prescribed distance, shows a change greater than a prescribed threshold value. Lapidus et al. teach an inspection region setting portions which sets said reference position as the boundary of said inspection region when a comparison result, obtained from said image comparing portion as a result of incrementally shifting said reference position by said prescribed distance, shows a change greater than a prescribed threshold value. (Lapidus et al., Column 18 Lines 5 – 12, Lines 40 – 57, and Column 19 Lines 11 - 26) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Kuwabara Masayuki with the teachings of Lapidus et al. Lapidus et al. teach determining an inspection region whereby once determined further attributes and measurements may be obtained through the use of visual tools. This modification would have been prompted in order to accurately compare the two regions of Kuwabara Masayuki by verifying that the positions for comparison belong to a first and second non-overlapping pattern region.

- With regards to claims 3 and 11, Kuwabara Masayuki teaches a pattern comparison inspection method and apparatus which comprises an imaging portion which captures an image of an inspection target pattern having a repeated pattern region with repeated patterns formed in a repeated fashion at a prescribed repeat pitch, (Kuwabara Masayuki,

Paragraph 0001 Lines 1 – 6, Paragraph 0005 Lines 1 - 5) a storing portion which stores said captured image of said inspection target pattern, (Kuwabara Masayuki, Paragraph 0004 Lines 6 - 11) a pattern comparing portion which compares, on said stored image, image signals taken from positions located a first integral multiple of said repeat pitch away from each other within an inspection region defined inside said repeated pattern region, Kuwabara Masayuki, Paragraphs 0006 - 0007) and a defect detecting portion which detects a defect in said inspection target pattern based on a result of said comparison, (Kuwabara Masayuki, Paragraphs 0006 – 0007) said apparatus comprising: a reference position selecting portion which selects a reference position which is judged whether it should be contained in said inspection region, by incrementally shifting said reference position by a prescribed distance within said inspection target pattern; (Kuwabara Masayuki, Paragraphs 0005 – 0007, Paragraph 0009, each pixel of a pattern is compared with it's respective pixel in an adjoining pattern) an image comparing portion which compares an image signal at said reference position with an image signal at a position located a second integral multiple of said repeat pitch away from said reference position; (Kuwabara Masayuki, Paragraph 0006 Lines 1 - 18) and an inspection region setting portion. (Kuwabara Masayuki, Paragraphs 0006 – 0008) Kuwabara Masayuki fails to teach an inspection region setting portion which sets said reference position as the boundary of said

inspection region when a comparison result, obtained from said image comparing portion as a result of incrementally shifting said reference position by said prescribed distance, shows a maximum change. Lapidus et al. teach an inspection region setting portion which sets said reference position as the boundary of said inspection region when a comparison result, obtained from said image comparing portion as a result of incrementally shifting said reference position by said prescribed distance, shows a maximum change. (Lapidus et al., Column 18 Lines 5 – 12, Lines 40 – 57, and Column 19 Lines 11 – 26, specifically Column 19 Line 18) It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Kuwabara Masayuki with the teachings of Lapidus et al. Lapidus et al. teach determining an inspection region whereby once determined further attributes and measurements may be obtained through the use of visual tools. This modification would have been prompted in order to accurately compare the two regions of Kuwabara Masayuki by verifying that the positions for comparison belong to a first and second non-overlapping pattern region.

- With regards to claims 4/1-3 and 12/9-11, Kuwabara Masayuki in view of Lapidus et al. teach a pattern comparison inspection method and apparatus as claimed in any one of claims 1 to 3 and 9 to 11, respectively. Kuwabara Masayuki teaches wherein said image comparing portion

- compares said image signal at said reference position with an image signal at a position located farther inside said repeated pattern region than said reference position is. (Kuwabara Masayuki, Drawings 5 & 6, Paragraphs 0012, 0014 – 0015, and 0023, Masayuki teaches comparing an image signal at a reference position with a position located farther inside, at an integer multiple R within, the repeating pattern)
- With regards to claims 5/1-3 and 13/9-11, Kuwabara Masayuki in view of Lapidus et al. teach a pattern comparison inspection method and apparatus as claimed in any one of claims 1 to 3 and 9 to 11, respectively. Kuwabara Masayuki teaches wherein a position located a prescribed distance inward of the boundary of said repeated pattern region is selected as said reference position, (Kuwabara Masayuki, Drawing 7, Paragraph 0023) and said inspection region is set by repeatedly performing said comparison by said image comparing portion while incrementally moving said reference position outwardly toward the boundary of said repeated pattern region. (Kuwabara Masayuki, Paragraph 0023)
 - With regards to claims 6/2-3 and 14/10-11, Kuwabara Masayuki in view of Lapidus et al. teach a pattern comparison inspection method and apparatus as claimed in claim 2 or 3 and claim 10 or 11, respectively.

Kuwabara Masayuki teaches a method and apparatus further comprising a tentative region setting portion which sets a tentative region a prescribed distance inward of the boundary of said repeated pattern region, (Kuwabara Masayuki, Drawing 7, Paragraph 0023, the positions used for comparison are merely temporary, tentative, as they are incremented) and wherein said image comparing portion compares said image signal at said reference position with an image signal at a position located inside said tentative region. (Kuwabara Masayuki, Paragraph 0023)

- With regards to claims 7/1-3 and 15/9-11, Kuwabara Masayuki in view of Lapidus et al. teach a pattern comparison inspection method and apparatus as claimed in any one of claims 1 to 3 and 9 to 11, respectively. Kuwabara Masayuki teaches a method and apparatus further comprising a tentative region setting portion which sets a tentative region a prescribed distance inward of the boundary of said repeated pattern region, (Kuwabara Masayuki, Drawing 7, Paragraph 0023, the region, for ex. A1, is merely tentative because once comparison is complete the region is reset) and wherein a position located inside said tentative region is selected as said reference position, (Kuwabara Masayuki, Drawing 7 and Paragraph 0023 - 0024) and said inspection region is set by repeatedly performing said comparison by said image comparing portion while incrementally shifting said reference position outwardly toward the

boundary of said repeated pattern region. (Kuwabara Masayuki, Drawing 7 and Paragraph 0023 - 0024)

- With regards to claims 8/1-3 and 16/9-11, Kuwabara Masayuki in view of Lapidus et al. teach a pattern comparison inspection method and apparatus as claimed in any one of claims 1 to 3 and 9 to 11, respectively. Kuwabara Masayuki teaches wherein a position located a prescribed distance outward of the boundary of said repeated pattern region is selected as said reference position, (Kuwabara Masayuki, Drawing 7 and Paragraph 0023 – 0024, the positions chosen for reference are outwardly position relative to the boundary) and said inspection region is set by repeatedly performing said comparison by said image comparing portion while incrementally shifting said reference position inwardly toward the boundary of said repeated pattern region. (Kuwabara Masayuki, Drawing 7 and Paragraph 0023 - 0024)

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Honda Toshifumi et al. JP Publication 2002-162366 A; which is directed to a defect inspection method and its system.

Art Unit: 2624

- Shibata et al. U.S. Patent No. 7,142,294; which is directed towards a method and apparatus for detecting defects.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC RUSH whose telephone number is (571)270-3017. The examiner can normally be reached on 7:30AM - 5:00PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on (571) 272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ER

/Samir A. Ahmed/
Supervisory Patent Examiner, Art Unit 2624